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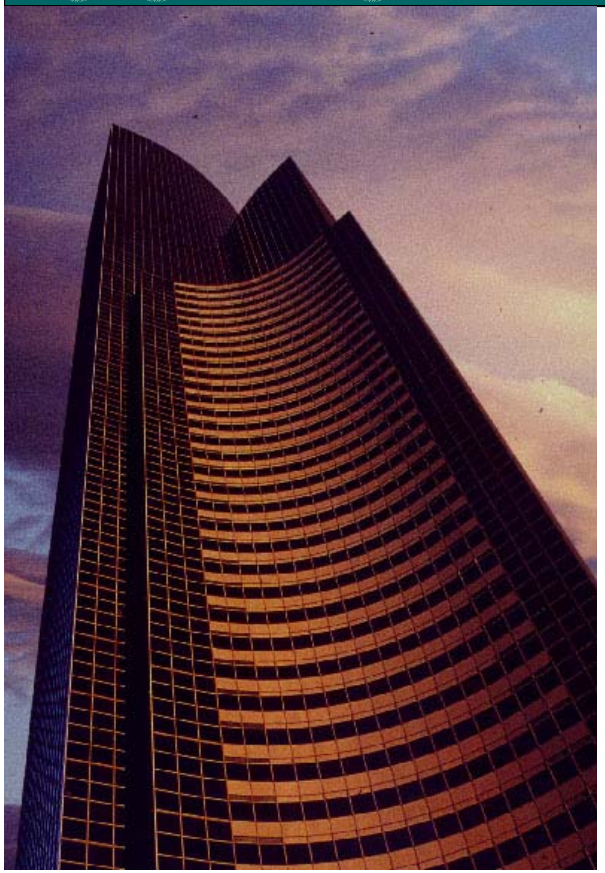
building performance



Project Update: Estabrook School

October 4, 2010

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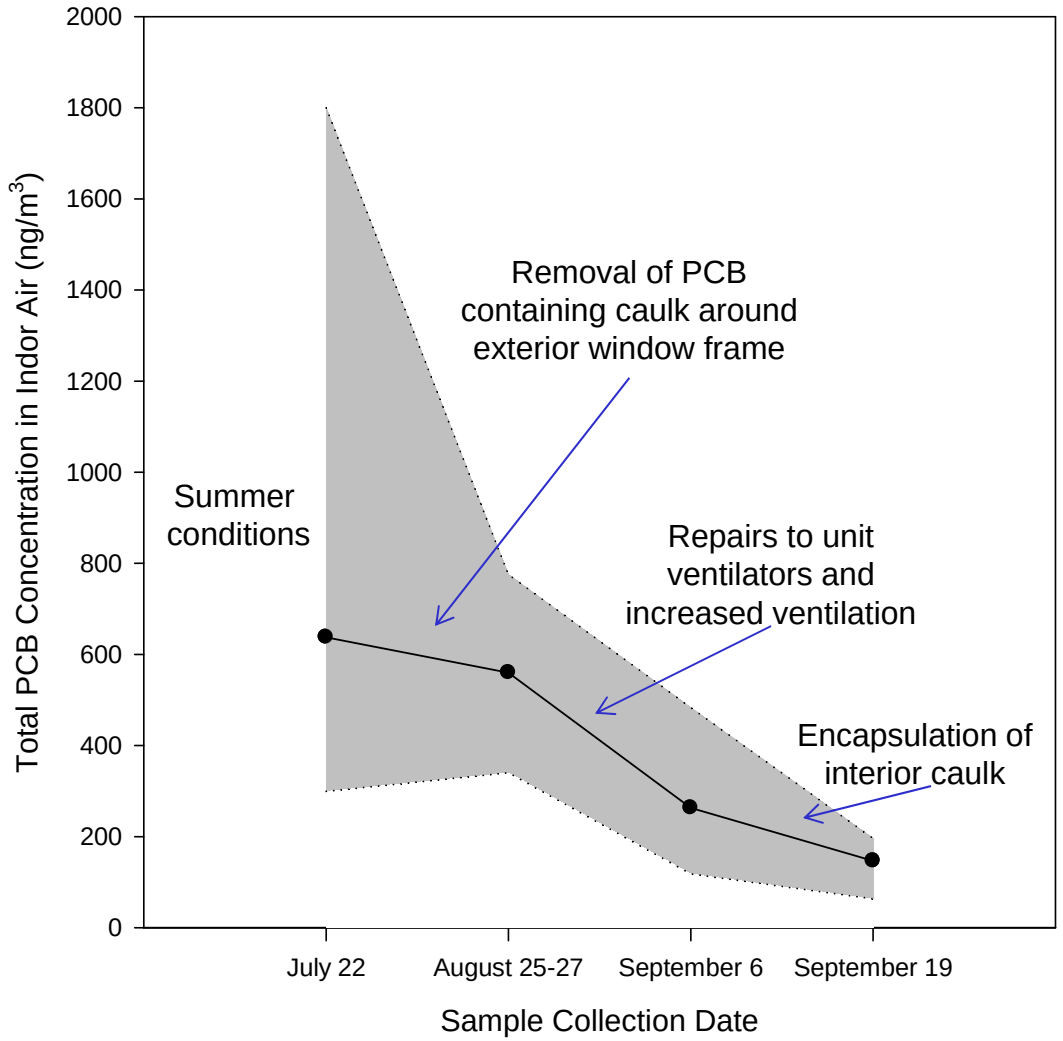
Agenda for Technical Items

- Previous air sampling results
  - Thru September 19, 2010 (encapsulation of interior caulk)
  - Precision
  - Analysis of data
- Timeline of recent activity
- Latest sampling results
  - Air
  - Bulk
  - Surface
- Next steps

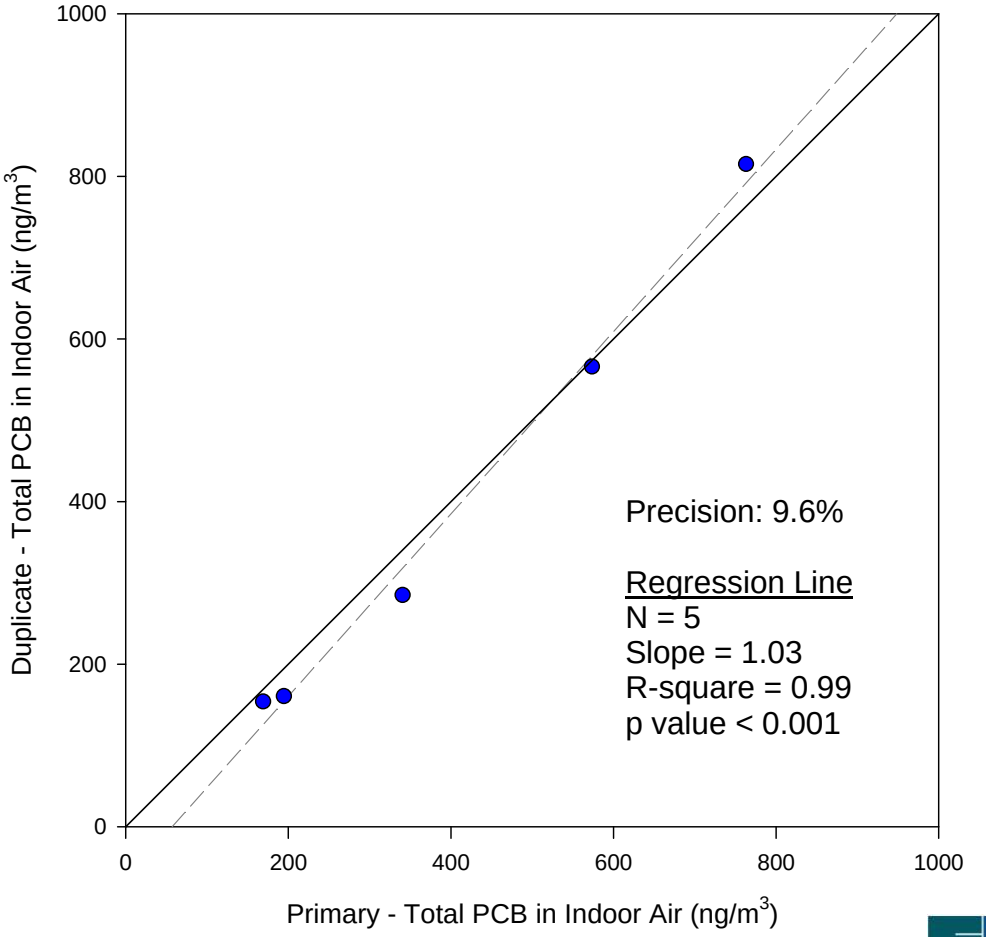
Air Concentrations Over Time

Average and range



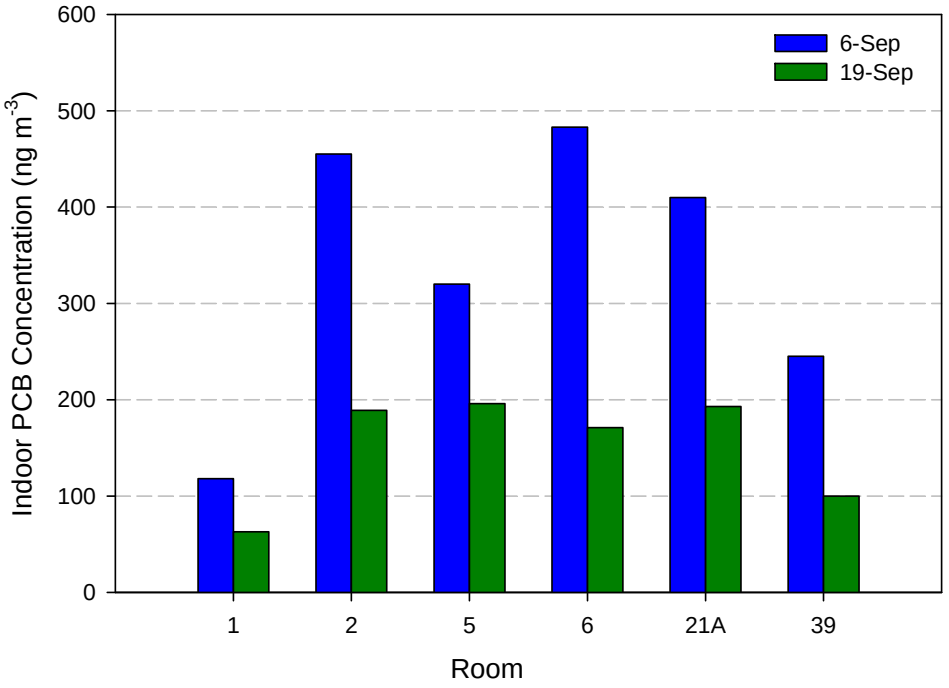
Precision of Air Measurements

- Determined from agreement between pairs of duplicate samples
- Calculated using EPA methods
- 5 pairs of duplicate indoor air samples collected at Estabrook thru September 19, 2010
- Precision of 9.6%
- Very strong agreement; individual measurements are precise to within 10%



Effect of Encapsulation

Room	OA Intake Flow	Reduction from Encapsulation as of 19-Sep	Encapsulated Interior Caulk as of 19-Sep
	CFM	%	%
1	1820	47	73
2	520	58	73
5	600	39	70
6	600	65	68
21A	440	53	78
39C	760	59	82

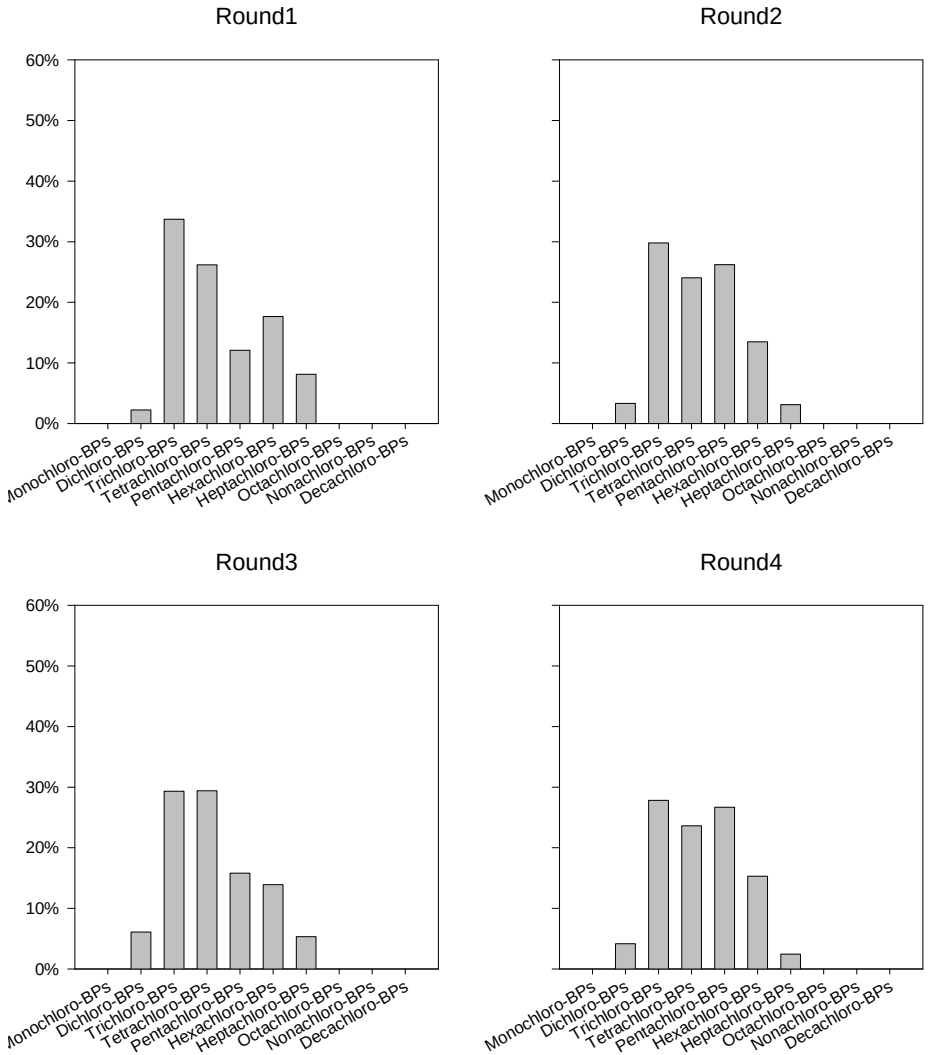


Effect of Lower Ventilation (Winter)

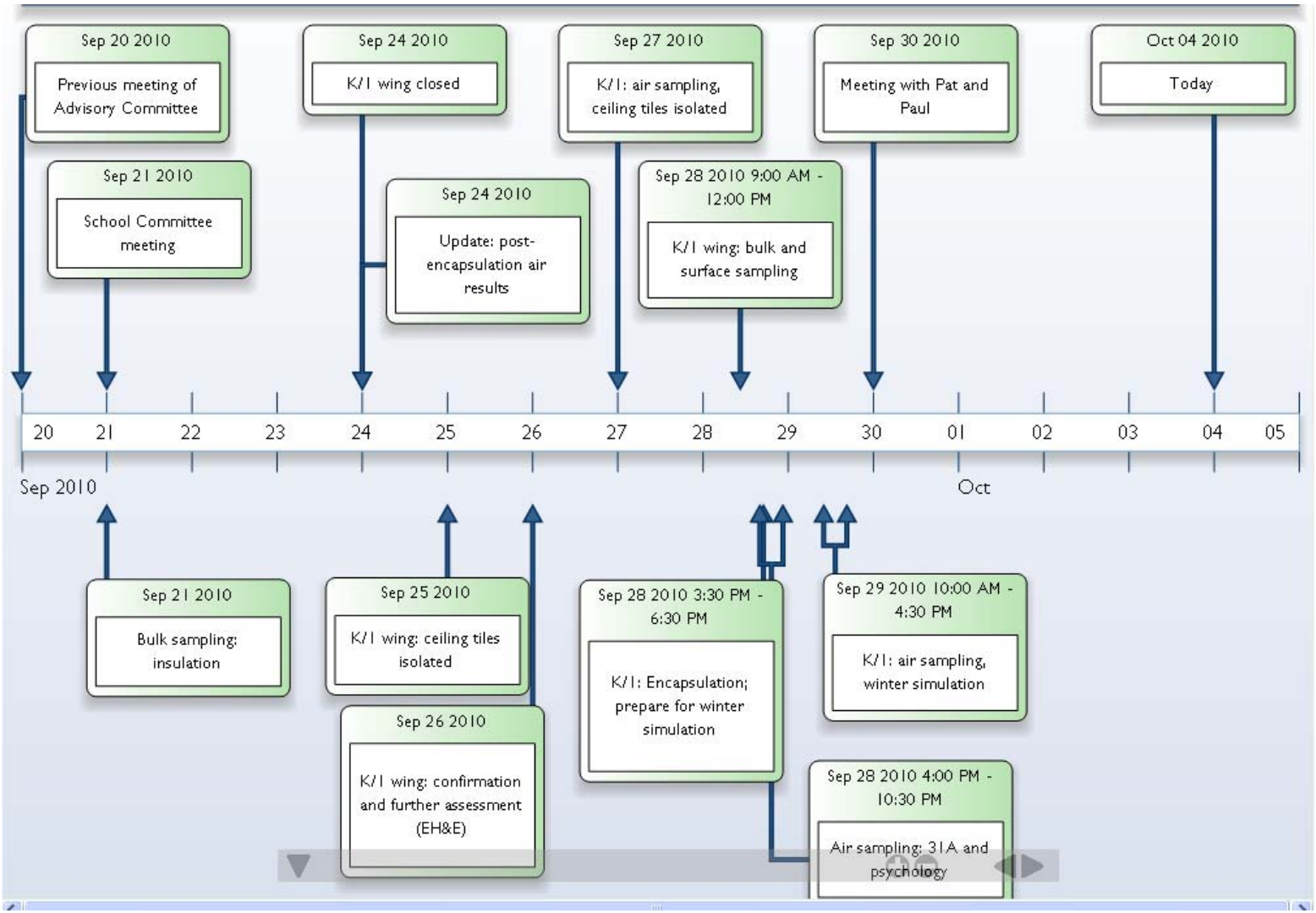
Room	OA Intake Flow (CFM)		Indoor PCB Concentration (ng m^{-3})		Encapsulated Interior Caulk as of 19-Sep
	6-Sep	19-Sep	6-Sep	19-Sep	%
13	820	300	184	155	16
24	470	150	226	173	23

Homolog Profile
Percent of total

Room 39C



Timeline of Recent Activity



Additional Encapsulation

September 28

- Rooms 1 - 5
  - Seal cavity between unit ventilator ‘wings’ and transite panel
- Rooms 1 and 2
  - Encapsulate panels behind fin tube radiator
- Room 5
  - Encapsulate panels behind built-in bookshelf
- Room 6
  - Encapsulate panels behind fin tube radiator cabinet

Estimated Effect of Further Encapsulation
Cooling Conditions

t would the concentration be if we covered the additional interior caulk behind
unit ventilators and radiators?

Room	OA Intake Flow (CFM)	Estimated Indoor PCB Conc. (ng m^{-3})
1	1820	43
2	520	91
5	600	143
6	600	21
21A	440	133
39C	760	67

Estimated Effect of Further Encapsulation
Heating Conditions

t would the concentration be during the Winter?

Room	OA Intake Flow* (CFM)	Estimated Indoor PCB Conc. (ng m^{-3})
1	1435	54
2	205	232
5	220	390
6	150	85
21A	170	345
39C	190	170

*Estimated based on 25% of supply flow.

Isolation of Ceiling Tiles

reparation

- Saturday, September 25, 2010: ceiling tiles isolated from classrooms by LVI
- Sunday, September 26, 2010: stabilization period, confirmation of pressurization and outdoor air flow, inspection of potential sources by EH&E

r Sampling

- Monday, September 27, 2010
- Rooms 1, 2, 5 and 6
  - Ventilation rates same as September 19 sampling
  - Samples collected
    - In classroom
    - Between polyethylene and tiles
- Quality assurance samples
- Results anticipated later this week

Isolated Ceiling Tiles, Additional Encapsulation and Reduced Outdoor Air Flow

esults will support evaluation of winter conditions and identification
f management options

reparation

- Remaining issues with operation of unit ventilators noted
- Low fan speed, thermostat calling for cooling (damper open)
  - Room 2: 400 cfm (550 at high fan speed)
  - Room 3: 350 (500)
  - Room 4: 300 (450)
  - Room 5: 500 (600)
  - Room 1 and 6: same as Round 4 (fan speed would not change)

ir sampling

- Wednesday, September 29, 2010
- Results anticipated later this week

Bulk Sample Results: K/1 Wing
September 21, 2010

Bulk Sample Results for Polychlorinated Biphenyls from Estabrook School, Lexington, Massachusetts, September 21, 2010

Sample ID	Description	Aroclor 1260[1,2] (ppm_w)	Notes
113832	Room 24, interior caulk, window sealant back corner	3200	1C(2800)
113833	Room 5, interior caulk, window sealant back corner	2100	1C(1700)

ppm_w parts per million by weight

[1] PCB concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).

[2] Aroclor 1016, 1221, 1232, 1248,1254 and 1260 also tested. All results below reporting levels, unless noted.

1C: Confirmation concentration reported from first column quantification.
2C: Confirmation concentration reported from second column quantification.

Bulk Sample Results: K/1 Wing

September 22, 2010

Bulk Sample Results for Polychlorinated Biphenyls from Estabrook School, Lexington, Massachusetts, September 22, 2010

Sample ID	Description	Aroclor 1260[1,2] (ppm_w)	Notes
113844	Room 1, fiberglass insulation	4	1C(3.9)
113845	Room 2, fiberglass insulation	3.5	2C(2.6)
113846	Room 3, fiberglass insulation	16	2C(9.9)
113847	Room 4, fiberglass insulation	21	2C(14)
113848	Room 5, fiberglass insulation	8.8	2C(7)
113849	Room 6, fiberglass insulation	4.1	2C(3.6)
113850	Duplicate 113849	4.7	2C(4.4)
113851	Hallway, fiberglass insulation	5.1	1C(4.6)

ppm_w parts per million by weight

[1] PCB concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).

[2] Aroclor 1016, 1221, 1232, 1248,1254 and 1260 also tested. All results below reporting levels, unless noted.

1C: Confirmation concentration reported from first column quantification.
2C: Confirmation concentration reported from second column quantification.

Bulk Sample Results: K/1 Wing

September 28, 2010

Bulk Sample Results for Polychlorinated Biphenyls from Estabrook School, Lexington, Massachusetts, September 28, 2010

Sample ID	Description	Aroclor 1242[1,2] (ppm_w)	Notes
117624	Room 5, acoustical panel	2.7* 2.6†	1C(2.5) 2C(2.2)
117625	Room 3, acoustical panel	2.5* 1.9†	1C(2.3) 2C(1.8)
117626	Room 5, carpet	1.3 1*	2C(0.87) 1C(0.87)
117627	Room 3, carpet	0.93 1.2*	2C(0.76) 1C(1)

ppm_w parts per million by weight

1 PCB concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).

2 Aroclor 1016, 1221, 1232, 1248,1254 and 1260 also tested. All results below reporting levels, unless noted.

* Aroclor 1254

† Aroclor 1260

1C: Confirmation concentration reported from first column quantification.
2C: Confirmation concentration reported from second column quantification.

Wipe Sample Results: K/1 Wing
September 28, 2010

Wipe Sample Results for Polychlorinated Biphenyls from Estabrook School
117 Grove Street, Lexington, Massachusetts, September 28, 2010

Sample ID	Description	Aroclor 1248[1,2] (µg/100cm^2)	Notes
117616	Room 6, bottom book shelf, wall adjacent to hall	BRL <1	—
117617	Duplicate 117616	BRL <1	—
117618	Room 6, fabric room divider, wall adjacent to hall	22	1C(21)
117619	Room 6, book shelf, wall with sink	BRL <1	—
117620	Room 1, wood shelf, above sink	BRL <1	—
117621	Room 1, counter top, next to sink	BRL <1	—
117622	Room 5, shelf under chalk board, wall with sink	BRL <1	—
117623	Room 3, top shelf	BRL <1	—

µg/100cm^2 micrograms per 100 square centimeters

[1] PCB concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).

[2] Aroclor 1016, 1221, 1232, 1242, 1254, and 1260 also tested. All results below reporting levels, unless noted.

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